Supplementary Materials

Supplementary Table 1. Agreement between manually and automatically extracted data for a random sample of n = 300 patients.

Variable	Cohen's kappa κ (95% CI)
Room air hypoxia (SpO2 < 94%)	0.75 (0.67 to 0.83)
Hypotension (MAP < 70)	0.87 (0.70 to 1.00)
Tachypneic (RR > 20)	0.60 (0.50 to 0.70)
Tachycardia (HR > 90)	0.62 (0.53 to 0.71)
Febrile (T > 100.3)	0.60 (0.48 to 0.72)
Received nasal cannula	0.65 (0.57 to 0.73)
Received non-rebreather or oxygen mask	0.86 (0.79 to 0.92)
Received high flow nasal cannula	0.66 (0.45 to 0.87)
Altered mental status at triage	0.83 (0.74 to 0.92)
Asthma	0.74 (0.62 to 0.85)
COPD	0.63 (0.46 to 0.80)
CAD	0.76 (0.64 to 0.89)
CHF	0.74 (0.60 to 0.88)
CKD	0.69 (0.55 to 0.83)
ESRD	0.93 (0.84 to 1.0)
DM	0.79 (0.73 to 0.86)
HTN	0.87 (0.81 to 0.93)
Cancer	0.64 (0.48 to 0.80)

Supplementary Table 2. Number of new COVID-19 cases per week over course of the pandemic from March 1st, 2020 to December 1st, 2020, and the associated rates of intubation and mortality, for all cases (n = 8247) and for cases without DNI orders (n = 7597).

Week After March 1st, 2020	Number of New COVID-19 Cases (n = 8247 total)	Number of COVID-19 Cases Without DNI Orders (n = 7597 total)	Number (%) of COVID-19 Patients Without DNI Orders That Were Intubated (n = 1628)	Number (%) of Deaths, COVID-19 Patients Overall (n = 2269)	Number (%) of Deaths, COVID-19 Patients Without DNI Orders (n = 1898)
1	61	60	18 (30%)	20 (32.8%)	19 (31.7%)
2	489	473	113 (23.9%)	121 (24.7%)	114 (24.1%)
3	1408	1355	321 (23.7%)	437 (31%)	406 (30%)
4	1731	1577	322 (20.4%)	623 (36%)	520 (33%)
5	1431	1268	225 (17.7%)	504 (35.2%)	393 (31%)
6	838	735	137 (18.6%)	258 (30.8%)	197 (26.8%)
7	489	430	75 (17.4%)	137 (28%)	107 (24.9%)

8	263	231	30 (13%)	47 (17.9%)	35 (15.2%)
9	192	180	12 (6.7%)	24 (12.5%)	21 (11.7%)
10	128	117	15 (12.8%)	8 (6.2%)	7 (6%)
11	93	88	5 (5.7%)	5 (5.4%)	5 (5.7%)
12	62	55	5 (9.1%)	5 (8.1%)	4 (7.3%)
13	56	54	4 (7.4%)	6 (10.7%)	6 (11.1%)
14	44	42	1 (2.4%)	0 (0%)	0 (0%)
15	30	30	0 (0%)	0 (0%)	0 (0%)
16	28	27	4 (14.8%)	1 (3.6%)	1 (3.7%)
17	27	26	2 (7.7%)	1 (3.7%)	0 (0%)
18	41	40	5 (12.5%)	4 (9.8%)	4 (10%)
19	33	30	2 (6.7%)	3 (9.1%)	2 (6.7%)
20	22	21	1 (4.8%)	1 (4.5%)	1 (4.8%)
21	19	19	2 (10.5%)	1 (5.3%)	1 (5.3%)
22	26	25	0 (0%)	0 (0%)	0 (0%)
23	32	31	1 (3.2%)	1 (3.1%)	1 (3.2%)
24	29	28	2 (7.1%)	1 (3.4%)	1 (3.6%)
25	18	17	3 (17.6%)	4 (22.2%)	3 (17.6%)
26	13	13	2 (15.4%)	2 (15.4%)	2 (15.4%)
27	25	25	3 (12%)	0 (0%)	0 (0%)
28	20	19	2 (10.5%)	1 (5%)	1 (5.3%)
29	20	20	1 (5%)	2 (10%)	2 (10%)
30	34	34	2 (5.9%)	3 (8.8%)	3 (8.8%)
31	29	29	2 (6.9%)	1 (3.4%)	1 (3.4%)
32	34	33	1 (3%)	0 (0%)	0 (0%)
33	39	39	4 (10.3%)	5 (12.8%)	5 (12.8%)
34	36	35	2 (5.7%)	3 (8.3%)	3 (8.6%)
35	53	50	7 (14%)	5 (9.4%)	4 (8%)
36	62	60	5 (8.3%)	5 (8.1%)	4 (6.7%)
37	103	99	8 (8.1%)	11 (10.7%)	10 (10.1%)
38	116	112	6 (5.4%)	11 (9.5%)	9 (8%)
39	73	70	6 (8.6%)	8 (11%)	6 (8.6%)

Supplementary Table 3. Differences in the primary clinical variables between patients intubated within 48 hours and those not intubated within 48 hours, before (left) and after (right) 1:1 nearest neighbor propensity score matching without replacement, from n = 7597 COVID-19 patients. * indicates p < 0.0001.

Variable	Missing Values (n = 7597)	*Before matching*			*After 1:1 matching*		
		Not Intubated Within 48 Hours (n = 6790)	Intubated Within 48 Hours (n = 807)	Univariate odds ratio (95% CI), p-value	Not Intubated Within 48 Hours (n = 807)	Intubated Within 48 Hours (n = 807)	Univariate odds ratio (95% CI), p-value
Age > 65	0 (0%)	2538 (37.4%)	361 (44.7%)	1.36 (1.17 to 1.57)*	359 (44.5%)	361 (44.7%)	1.01 (0.83 to 1.23), p = 0.92

Male	0 (0%)	4216 (62.1%)	522 (64.7%)	1.12 (0.96 to 1.3), p = 0.15	529 (65.6%)	522 (64.7%)	0.96 (0.78 to 1.18), p = 0.71
BMI > 30	425 (5.7%)	2578 (38.0%)	379 (47.0%)	1.45 (1.25 to 1.68)*	358 (44.4%)	379 (47.0%)	1.11 (0.91 to 1.35), p = 0.29
Ever Smoker	1248 (16.7%)	1469 (21.6%)	162 (20.1%)	0.91 (0.76 to 1.09), p = 0.30	167 (20.7%)	162 (20.1%)	0.96 (0.76 to 1.23), p = 0.75
Hispanic	483 (6.5%)	4817 (70.9%)	623 (77.2%)	1.39 (1.17 to 1.65)*	614 (76.1%)	623 (77.2%)	1.06 (0.85 to 1.34), p = 0.59
Black	0 (0%)	2177 (32.1%)	202 (25%)	0.71 (0.6 to 0.84)*	203 (25.2%)	202 (25%)	0.99 (0.79 to 1.24), p = 0.95
Triaged Before May 1st, 2020	0 (0%)	5426 (79.9%)	729 (90.3%)	2.35 (1.85 to 2.99)*	728 (90.2%)	729 (90.3%)	1.01 (0.73 to 1.41), p = 0.93
Inpatient Census on Admission Date > 400 patients	0 (0%)	3433 (50.6%)	449 (55.6%)	1.23 (1.06 to 1.42), p = 0.006	455 (56.4%)	449 (55.6%)	0.97 (0.80 to 1.18), p = 0.76
Arrive by EMS	0 (0%)	4184 (61.6%)	664 (82.3%)	2.89 (2.4 to 3.49)*	661 (81.9%)	664 (82.3%)	1.03 (0.8 to 1.32), p = 0.84
Medicare/ Medicaid Recipient	0 (0%)	5198 (76.6%)	657 (81.4%)	1.34 (1.11 to 1.62), p = 0.002	636 (78.8%)	657 (81.4%)	1.18 (0.92 to 1.50), p = 0.19
ESI 1 or 2	89 (1.2%)	2199 (32.4%)	596 (73.9%)	5.9 (5 to 6.96)*	578 (71.6%)	596 (73.9%)	1.12 (0.9 to 1.39), p = 0.31
Altered mental status	0 (0%)	961 (14.2%)	267 (33.1%)	3 (2.55 to 3.53)*	245 (30.4%)	267 (33.1%)	1.13 (0.92 to 1.4), p = 0.23
Asthma	0 (0%)	1032 (15.2%)	115 (14.3%)	0.93 (0.75 to 1.14), p = 0.47	111 (13.8%)	115 (14.3%)	1.04 (0.79 to 1.38), p = 0.77
COPD	0 (0%)	446 (6.6%)	79 (9.8%)	1.54 (1.2 to 1.98), p = 0.001	71 (8.8%)	79 (9.8%)	1.12 (0.8 to 1.57), p = 0.49
CAD	0 (0%)	856 (12.6%)	99 (12.3%)	0.97 (0.78 to 1.21), p = 0.78	101 (12.5%)	99 (12.3%)	0.98 (0.73 to 1.31), p = 0.88
CHF	0 (0%)	675 (9.9%)	91 (11.3%)	1.15 (0.91 to 1.45), p = 0.23	92 (11.4%)	91 (11.3%)	0.99 (0.73 to 1.34), p = 0.93
CKD	0 (0%)	542 (8%)	65 (8.1%)	1.01 (0.77 to 1.32), p = 0.94	66 (8.2%)	65 (8.1%)	0.98 (0.69 to 1.41), p = 0.92
ESRD	0 (0%)	409 (6%)	43 (5.3%)	0.88 (0.64 to 1.21), p = 0.43	46 (5.7%)	43 (5.3%)	0.93 (0.61 to 1.43), p = 0.74
DM	0 (0%)	3066 (45.2%)	397 (49.2%)	1.18 (1.02 to 1.36), p = 0.029	415 (51.4%)	397 (49.2%)	0.91 (0.75 to 1.11), p = 0.37

HTN	0 (0%)	4181 (61.6%)	527 (65.3%)	1.17 (1.01 to 1.37), p = 0.039	546 (67.7%)	527 (65.3%)	0.9 (0.73 to 1.11), p = 0.31
Cancer	0 (0%)	700 (10.3%)	49 (6.1%)	0.56 (0.42 to 0.76)*	62 (7.7%)	49 (6.1%)	0.78 (0.53 to 1.15), p = 0.20
Hypoxemic (SpO2 < 94)	89 (1.2%)	2679 (39.5%)	482 (59.7%)	2.28 (1.96 to 2.64)*	479 (59.4%)	482 (59.7%)	1.02 (0.83 to 1.24), p = 0.87
Tachycardic (HR > 90)	96 (1.3%)	3721 (54.8%)	545 (67.5%)	1.72 (1.47 to 2)*	556 (68.9%)	545 (67.5%)	0.94 (0.76 to 1.16), p = 0.55
Tachypneic (RR > 20)	269 (3.6%)	1999 (29.4%)	503 (62.3%)	3.97 (3.41 to 4.61)*	509 (63.1%)	503 (62.3%)	0.97 (0.79 to 1.19), p = 0.75
Hypotensive (MAP < 70 mmHg)	319 (4.3%)	246 (3.6%)	68 (8.4%)	2.45 (1.85 to 3.24)*	66 (8.2%)	68 (8.4%)	1.03 (0.73 to 1.47), p = 0.85
Febrile (T > 100.3 °F)	1143 (15.3%)	1489 (21.9%)	197 (24.4%)	1.15 (0.97 to 1.36), p = 0.10	196 (24.3%)	197 (24.4%)	1.01 (0.8 to 1.26), p = 0.95
Anion Gap > 16 mEq/L	1004 (13.5%)	2368 (34.9%)	415 (51.4%)	1.98 (1.71 to 2.29)*	418 (51.8%)	415 (51.4%)	0.99 (0.81 to 1.2), p = 0.88
BUN > 20 mg/dL	998 (13.4%)	2678 (39.4%)	579 (71.7%)	3.9 (3.32 to 4.58)*	559 (69.3%)	579 (71.7%)	1.13 (0.91 to 1.4), p = 0.27
HCO3 < 18 mEq/L	461 (6.2%)	477 (7%)	154 (19.1%)	3.12 (2.56 to 3.81)*	141 (17.5%)	154 (19.1%)	1.11 (0.87 to 1.43), p = 0.40
Creatinine > 1.2 mg/dL	998 (13.4%)	2082 (30.7%)	489 (60.6%)	3.48 (2.99 to 4.04)*	454 (56.3%)	489 (60.6%)	1.2 (0.98 to 1.46), p = 0.077
D-dimer > 1000 ng/mL	1988 (26.6%)	2096 (30.9%)	479 (59.4%)	3.27 (2.82 to 3.8)*	467 (57.9%)	479 (59.4%)	1.06 (0.87 to 1.3), p = 0.54
Ferritin > 200 ng/mL	2125 (28.5%)	6014 (88.6%)	752 (93.2%)	1.76 (1.33 to 2.34)*	754 (93.4%)	752 (93.2%)	0.96 (0.65 to 1.42), p = 0.84
LDH > 280 U/L	1902 (25.5%)	5427 (79.9%)	769 (95.3%)	5.08 (3.65 to 7.08)*	757 (93.8%)	769 (95.3%)	1.34 (0.87 to 2.06), p = 0.19
Hgb < 9 g/dL	34 (0.5%)	479 (7.1%)	120 (14.9%)	2.3 (1.86 to 2.85)*	119 (14.7%)	120 (14.9%)	1.01 (0.77 to 1.33), p = 0.94
Lymphocytes < 1.0 x 10^3/µL	35 (0.5%)	2829 (41.7%)	498 (61.7%)	2.26 (1.94 to 2.62)*	479 (59.4%)	498 (61.7%)	1.1 (0.9 to 1.35), p = 0.33
Neutrophils > 8.0 x 10^3/µL	34 (0.5%)	1631 (24%)	493 (61.1%)	4.97 (4.27 to 5.78)*	474 (58.7%)	493 (61.1%)	1.1 (0.9 to 1.35), p = 0.33
Platelets < 150 x 10^3/µL	36 (0.5%)	1018 (15%)	196 (24.3%)	1.82 (1.53 to 2.16)*	180 (22.3%)	196 (24.3%)	1.12 (0.89 to 1.41), p = 0.34
Procalcitonin > 0.30 ng/mL	1576 (21.1%)	2801 (41.3%)	640 (79.3%)	5.46 (4.57 to 6.51)*	631 (78.2%)	640 (79.3%)	1.07 (0.84 to 1.36), p = 0.58
pCO2 > 50 mmHg	2135 (28.6%)	927 (13.7%)	241 (29.9%)	2.69 (2.28 to 3.18)*	201 (24.9%)	241 (29.9%)	1.28 (1.03 to 1.6), p = 0.026
Bilateral opacities	871 (11.7%)	4551 (67%)	646 (80%)	1.97 (1.65 to 2.36)*	663 (82.2%)	646 (80%)	0.87 (0.68 to 1.12), p = 0.28
Infiltrate	871 (11.7%)	1603 (23.6%)	236 (29.2%)	1.34 (1.14 to 1.57)*	240 (29.7%)	236 (29.2%)	0.98 (0.79 to 1.21), p = 0.82
Admitted to Hospital 1	0 (0%)	543 (8%)	17 (2.1%)	0.25 (0.15 to 0.4)*	24 (3%)	17 (2.1%)	0.7 (0.37 to 1.32), p = 0.27

Admitted to Hospital 2	0 (0%)	678 (10%)	84 (10.4%)	1.05 (0.82 to 1.33), p = 0.70	93 (11.5%)	84 (10.4%)	0.89 (0.65 to 1.22), p = 0.47
Admitted to Hospital 3	0 (0%)	1095 (16.1%)	116 (14.4%)	0.87 (0.71 to 1.07), p = 0.19	128 (15.9%)	116 (14.4%)	0.89 (0.68 to 1.17), p = 0.40
Admitted to Hospital 4	0 (0%)	447 (6.6%)	47 (5.8%)	0.88 (0.64 to 1.2), p = 0.40	45 (5.6%)	47 (5.8%)	1.05 (0.69 to 1.6), p = 0.83
Admitted to Hospital 5	0 (0%)	836 (12.3%)	77 (9.5%)	0.75 (0.59 to 0.96), p = 0.023	86 (10.7%)	77 (9.5%)	0.88 (0.64 to 1.22), p = 0.45
Admitted to Hospital 6	0 (0%)	858 (12.6%)	51 (6.3%)	0.47 (0.35 to 0.62)*	65 (8.1%)	51 (6.3%)	0.77 (0.53 to 1.13), p = 0.17
Admitted to Hospital 7	0 (0%)	823 (12.1%)	190 (23.5%)	2.23 (1.87 to 2.67)*	169 (20.9%)	190 (23.5%)	1.16 (0.92 to 1.47), p = 0.20
Admitted to Hospital 8	0 (0%)	246 (3.6%)	26 (3.2%)	0.89 (0.59 to 1.34), p = 0.56	22 (2.7%)	26 (3.2%)	1.19 (0.67 to 2.11), p = 0.55
Admitted to Hospital 9	0 (0%)	260 (3.8%)	11 (1.4%)	0.35 (0.19 to 0.64), p = 0.001	11 (1.4%)	11 (1.4%)	1.0 (0.43 to 2.32), p = 0.99
Admitted to Hospital 10	0 (0%)	676 (10%)	80 (9.9%)	1 (0.78 to 1.27), p = 0.97	78 (9.7%)	80 (9.9%)	1.03 (0.74 to 1.43), p = 0.86
Admitted to Hospital 11	0 (0%)	328 (4.8%)	108 (13.4%)	3.04 (2.42 to 3.84)*	86 (10.7%)	108 (13.4%)	1.3 (0.96 to 1.75), p = 0.093
Received nasal cannula oxygen	0 (0%)	3607 (53.1%)	545 (67.5%)	1.84 (1.57 to 2.14)*	551 (68.3%)	545 (67.5%)	0.97 (0.78 to 1.19), p = 0.74
Received non-rebreather or oxygen mask	0 (0%)	1709 (25.2%)	429 (53.2%)	3.37 (2.91 to 3.92)*	449 (55.6%)	429 (53.2%)	0.9 (0.74 to 1.1), p = 0.31
Received high flow nasal cannula	0 (0%)	535 (7.9%)	76 (9.4%)	1.22 (0.94 to 1.56), p = 0.12	96 (11.9%)	76 (9.4%)	0.77 (0.56 to 1.06), p = 0.10
Received non-invasive positive pressure ventilation	0 (0%)	924 (13.6%)	182 (22.6%)	1.85 (1.55 to 2.21)*	217 (26.9%)	182 (22.6%)	0.79 (0.63 to 0.99), p = 0.044

Supplementary Table 4. Sensitivity analyses. The main outcome is reported (effect of intubation within 48 hours of triage on mortality, excluding patients with DNI orders within 48 hours of triage), alongside the following sensitivity analyses: a) not removing DNI patients, b) comparing patients intubated at any time point to those never intubated, c) only including patients that received high flow nasal cannula, non-invasive ventilation, invasive ventilation and/or were admitted to the ICU, and d) comparing patients intubated within 48 hours of triage to those intubated after 48 hours. For each condition, the outcome reported is the Cox hazard ratio for all-cause in-hospital mortality after 1:1 nearest neighbor propensity score matching without replacement.

Condition	Main Outcome	(a) Without Removing DNI Patients	(b) Without Restricting to First 48 Hours After Triage (Intubation at any time point)	(c) Restricting Only to Patients Who Received HFNC, NIV, Intubation and/or Were Admitted to the ICU	(d) Comparing Intubation Within 48 Hours to Intubation After 48 Hours of Triage
Hazard ratio (95% CI)	1.30 (1.15 to 1.48), p < 0.0001	1.17 (1.04 to 1.33), p = 0.012	1.62 (1.45 to 1.80), p < 0.0001	1.18 (1.05 to 1.31), p = 0.0036	1.09 (0.94 to 1.26), p = 0.26
Number of patients (intubations, %)	7597 (807, 10.6%)	8247 (807, 9.8%)	7597 (1628, 21.4%)	2557 (807, 31.6%)	1628 (807, 49.6%)
Covariate balance after matching (absolute SMD, 95% CI)	0.051 (0.038 to 0.063)	0.035 (0.026 to 0.043)	0.091 (0.060 to 0.12)	0.094 (0.065 to 0.12)	0.054 (0.044 to 0.064)